

Notice of Allowability

Application No.

09/905,515

Examiner

Rodney G. McDonald

Applicant(s)

NOWAK ET AL.

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of October 26, 2004.
2. ☒ The allowed claim(s) is/are 7-14, 20, 21, 25-28 and 30-33.
3. ☒ The drawings filed on 13 July 2001 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____



RODNEY G. McDONALD
PRIMARY EXAMINER

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Roger Barrett on November 9, 2004.

The application has been amended as follows:

In Claims 7-14, 28, 30-32, line 1, change the status indicator "Allowed" to "Previously Presented". Note that this does not change the scope of the claims but is merely made to conform to the requirement for appropriate status indicators.

The following is an examiner's statement of reasons for allowance:

Claims 7-14 and 20 are allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including introducing a second precursor comprising oxygen into the equipment, wherein the second precursor bypasses the disassociator; and using the first and second portions of the first plurality of radicals and constituents of the second precursor to clean the equipment, wherein the oxygen combines with carbon on the equipment to form CO_y.

Claim 21 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including the semiconductor equipment cleaning system including a gas delivery system to introduce the portion of the first gas,

a portion of the second gas, a third gas comprising oxygen, and a re-associated portion of the second gas into the housing with the third gas bypassing the dissociator.

Claim 25 is allowable over the prior art of record because the prior art of record does not teach the claims method for cleaning a deposition chamber including utilizing as the first precursor gas a gas comprised of fluorine and utilizing as the second precursor gas a gas comprised of chlorine.

Claim 26 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including dissociating at least part of the less reactive elements in the deposition chamber prior to flowing a portion of the second plurality of radicals into the deposition chamber, and wherein dissociating the second precursor gas is performed exclusively in the remote dissociator.

Claim 27 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including dissociating at least part of the less reactive elements in the deposition chamber after flowing a portion of the second plurality of radicals into the deposition chamber.

Claim 28-32 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including cleaning silicon and carbon based contaminants from the chamber where the contaminants comprise BLO_k .

Claim 33 is allowable over the prior art of record because the prior art of record does not teach the claimed subject matter including a computer-readable storage medium having a computer-readable embodied therein for directing operation of a semiconductor cleaning system and including instructions for operating the


semiconductor cleaning system in accordance with the following: delivering a first precursor gas comprising fluorine and a second precursor gas comprising chlorine into the remote dissociator; dissociating at least part of the first precursor gas in the remote dissociator to form a first plurality of radicals; dissociating at least part of the second precursor gas in the remote dissociator to form a second plurality of radicals different from the first plurality of radicals, the first and second plurality of radicals adapted for reacting with different chemical compounds on the equipment; and dissociating less reactive elements in the local dissociator, wherein the less reactive elements are formed from a portion of the first plurality of the first plurality of radicals the combine in the gas delivery system.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Rodney G. McDonald
Primary Examiner
Art Unit 1753

RM
November 9, 2004